

North Carolina Department of Transportation Materials & Tests Unit (Metals Section)



Field Welder Test Program

Origination Date: Friday, 1/06/2006

Revision Date: Wednesday, 5/09/2018

Scope:

The Field Welder Certification Program is conducted by the Metals Section of the Materials & Tests Unit. The program is maintained to better ensure that qualified personnel are performing the welding operations on NCDOT projects.

Weld Test Specifications and Reference Standards:

NCDOT Standard Specifications for Roads and Structures January 2018

AASHTO/AWS D1.5M/D1.5:2015 Bridge Welding Code

AWS D1.1/D1.1M:2015 Structural Welding Code - Steel

These codes document the fit up, positioning, and acceptance criteria for the test coupons. The weld test will be administered to these specifications. Shielded Metal Arc Welding [SMAW] is currently the only welding process in which a contract field welder may be certified.

Weld Test Scheduling:

The first step in the weld test process is to submit an application. The link to the application is found here:

<https://connect.ncdot.gov/resources/Materials/Pages/FieldWelderCertificationProgram.aspx>

Once filled out, click “Send”. You will be contacted shortly afterwards to schedule your test date.

It is important to keep in mind that this is a test. Your test proctor will assist with basic guidance related to coupon fit up and positioning, but beyond that, it is entirely up to the welder to complete the test. It is recommended that prior to testing, the welder should study and practice as needed.

Weld testing begins at 8:00 AM and ends at 12:00 Noon sharp.

NCDOT Weld Shop Facilities:

The test is conducted in our shop. We have for use, stands for holding the weld test coupons, several weld screens and a work bench. We supply the plate sets with backing bars and pipe coupons with backing rings. The plate sets and pipe are pre-beveled.

Note: We do not have vending machines. You will need to bring your own drinks and food with you.

Smoking is permitted only in designated areas.

Mailing and Physical address:

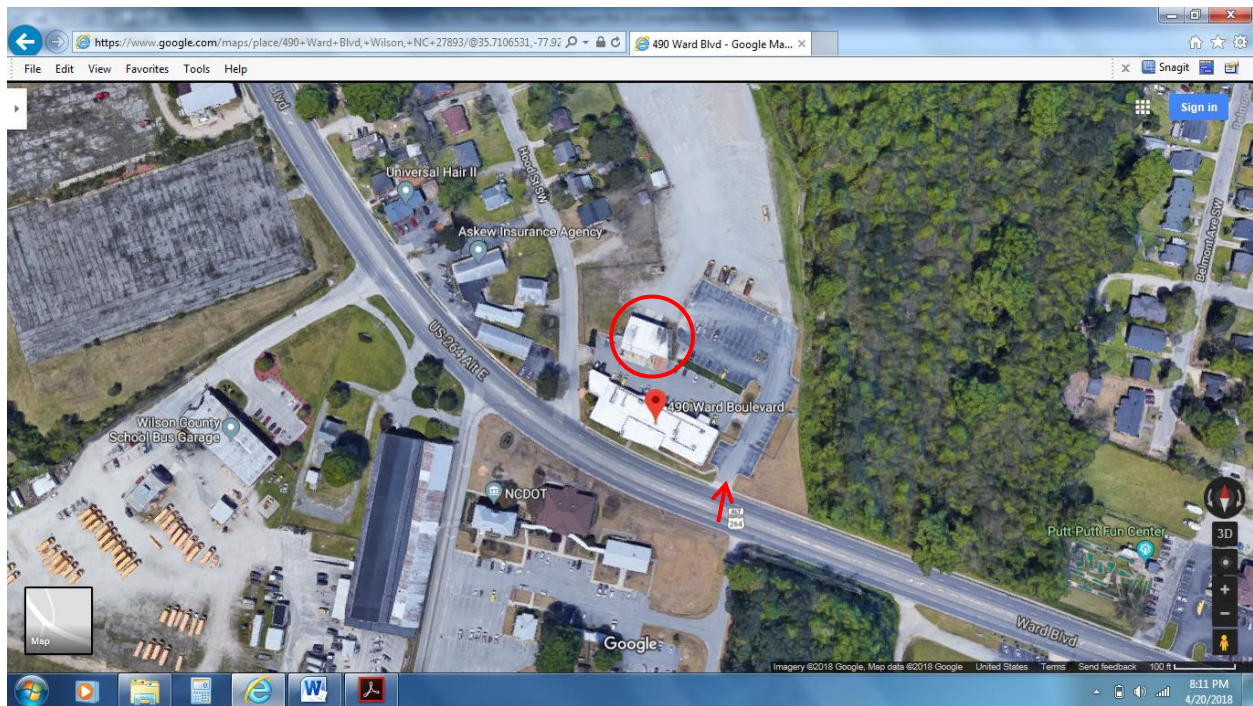
Mailing address:

NCDOT, Division of Highways
Materials and Tests Unit
509 Ward Blvd.
PO Box 3165
Wilson, NC 27895

Physical address:

NCDOT, Division of Highways
Materials and Tests Unit
490 Ward Blvd.
Wilson, NC 27893

Enter at the red arrow and drive around to the building in the red circle.



Tools, Equipment and Supplies Required For The Weld Test:

A - Welding Machine

B - Electrode Oven

C - Metal hermetically sealed container of 7018 electrodes

D - Fillet Weld Gauge Set

E - Wire Brush

F - Chipping Hammer

G - Clamps

H - Gas Torch

I - Scrap metal for adjusting machine settings

J - Welding helmets, gloves, safety glasses and any other PPE needed.

K - Electric grinder with grinding wheels and wire wheels. Plates may be cleaned prior to welding and coupons prepped for testing after welding.

Grinding is not permitted during welding. The welder may be permitted to clean with a wire wheel.

L - US state issued Driver's License or US state issued photo ID. **No other form of ID will be accepted.**

M - Metal Protractor

Weld Test Fee Schedule:

SIP Welder - \$250.00

Bridge Welder [Limited] - \$500.00

Bridge welder -\$500.00

All applicants must register through RegOnline, accessed on the Field Welder Testing Program web page, prior to testing. A Check or Money Order made out to the North Carolina Department of Transportation for the amount of the weld test must be submitted before testing begins. Credit card payments may be made through RegOnline. **The welder being tested is responsible for making sure payment is received by NCDOT, even if the fee is paid by a 3rd party.**

Field Welder Test Classifications:

1- SIP Welder

SMAW 1G - This test requires the technician to apply weld to a set of pre-beveled 3/8" thick x 3" x 7" plates that are joined to a 3/8" x 1" backing bar. The test coupon shall be in a fixed flat position.

Passing this test qualifies the technician to apply groove welds in the flat position on material that is 1/8" to 3/4" thick and fillet welds in the flat and horizontal positions on material that is 1/8" to unlimited thickness (including pipe that is ≥ 24 " in diameter) with backing, back gouging or both.

Cleaning is with the following hand tools only: chipping hammers, picks, wire brushes, etc. Cleaning with a wire wheel in a grinder may be permitted. Altering of the weld bead passes either by grinding or filing will not be permitted. Once welding is completed the weld cap must be ground flush.

2- Bridge Welder [Limited]

SMAW 3G/4G - This test requires the technician to apply weld to a set of pre-beveled 3/8" thick x 3" x 7" plates that are joined to a 3/8" x 1" backing bar. The test coupons shall be in a fixed vertical/overhead position (respectively). The technician must pass the vertical and overhead positions to receive a qualified status.

Passing this set of tests qualifies the technician to apply fillet welds on material that is 1/8" to unlimited thickness and groove welds on material that is 1/8" to 3/4" thick (including pipe that is \geq - greater than 24" in diameter) in any position with backing, back gouging or both.

Cleaning is with hand tools only, chipping hammers, picks, wire brushes, etc. Cleaning with a wire wheel in a grinder may be permitted. There is no altering of the weld bead passes either by grinding or filing. Once welding is completed the weld cap will be ground flush.

3- Bridge Welder

SMAW 6G - This test requires the technician to apply weld to a set of pre-beveled 6" diameter schedule 80 pipe that are joined by a pre-fabricated backing ring. The test coupon is mounted on a 45° angle and is fixed (rotating is not permitted).

Passing this test qualifies the technician to apply fillet and groove welds on pipe or plate in any position on material that is 3/16" to unlimited thickness (including pipe that is 4" in diameter to unlimited) with backing, back gouging or both.

Cleaning is with hand tools only, chipping hammers, picks, wire brushes, etc. Cleaning with a wire wheel in a grinder may be permitted. There is no altering of the weld bead passes either by grinding or filing.

Testing and Acceptance

Each coupon will be visually inspected during welding based on AWS D1.5 and AWS D1.1 welding codes. Should welds not meet these required standards the test will be stopped and the welder informed of his options at the test proctor's discretion.

If found visually acceptable the test coupon will be bend tested. Acceptance is based on criteria set in AWS D1.5 and AWS D1.1.

The welder will be notified of the test results once available. **Due to our work load this process can take several days.**

Successful Completion of Qualification Test

A Field Welder Certification card will be mailed to the address provided. The welder must have the card available at all times when working on a NCDOT project. Field Welder Certification is valid for 5 years assuming compliance with applicable specifications.

Failure of Qualification Test

A welder who fails only one of the plates on the SMAW 3G/4G Test is required to retest within one month and weld two plates of the position failed. Both plates must pass. Not retesting in one month is a test failure and both plates will need to be welded when the welder retests.

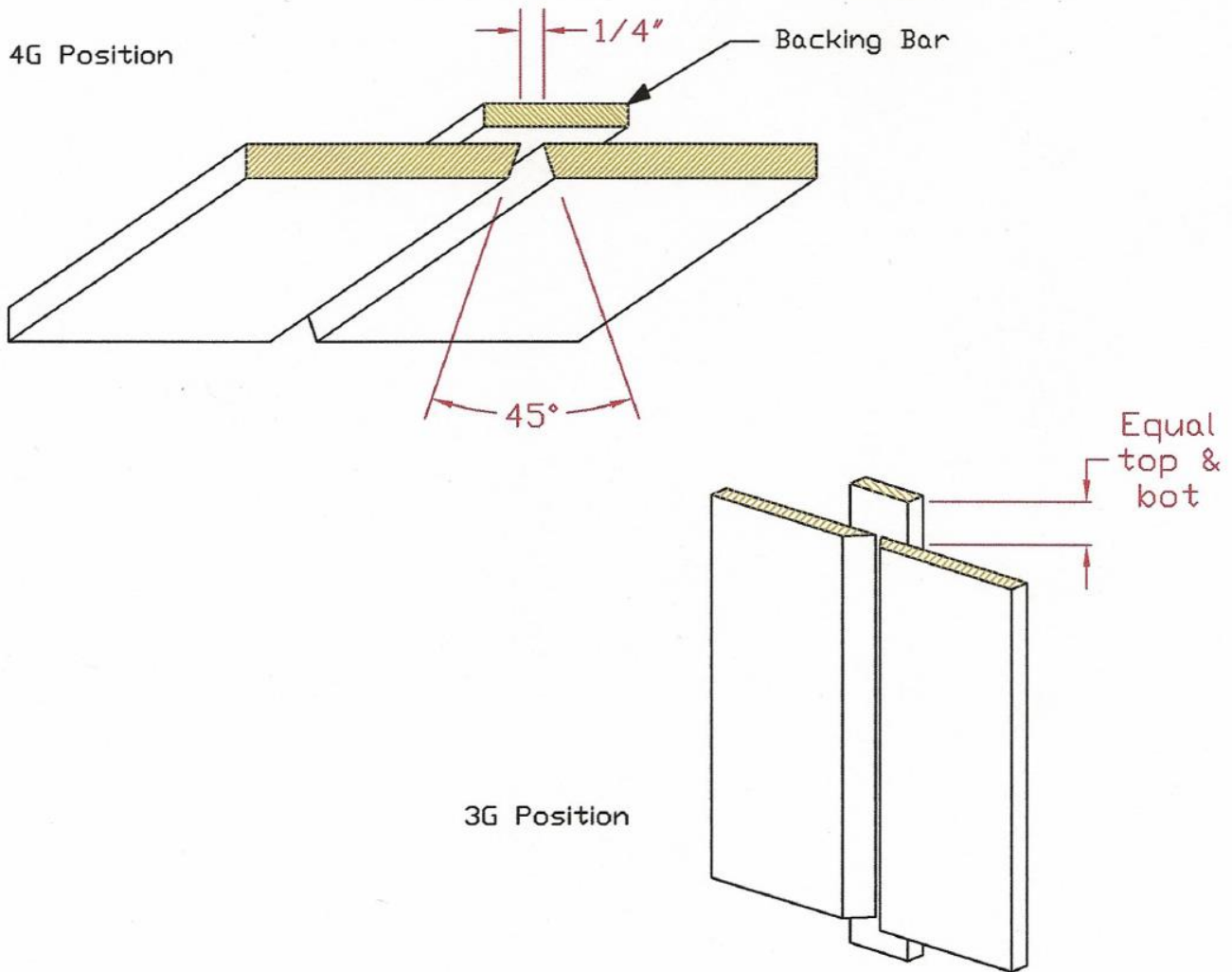
If the welder fails a retest then another weld test will not be scheduled for 90 days. A failure of this test starts a 180 day retest cycle.

Note: The weld test fee rates apply to retesting.

Revocation of the Field Welder Certification ID card

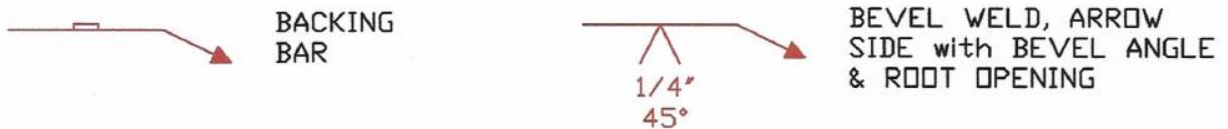
A welder who fails to comply with the applicable codes and specifications on a NCDOT project may have their certification revoked either temporarily or permanently based on the severity of the issue or at the discretion of the State Materials Engineer and/or his designated representatives.

3/8" Test Plate Drawing

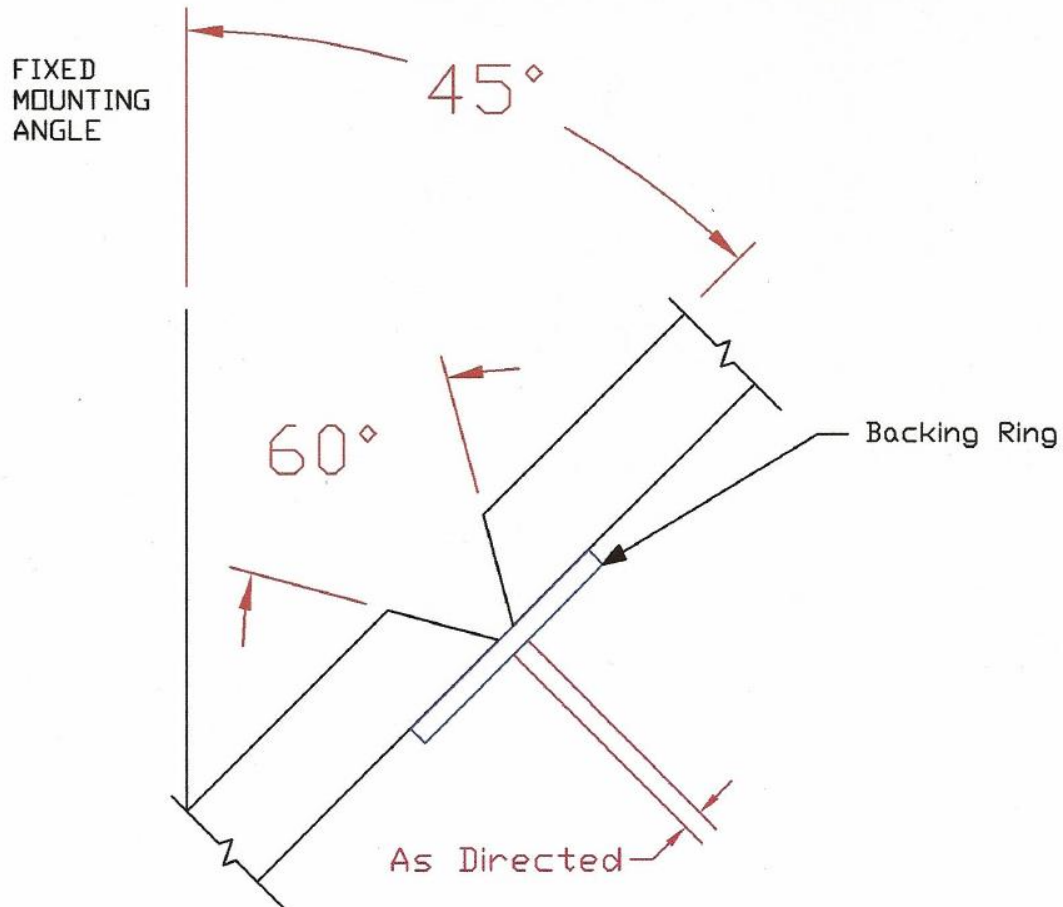


3G-4G GROOVE WELD JOINT DETAILS

Weld Symbol definitions per AWS A2.4:2007



Pipe Test Drawing



6G PIPE JOINT DETAILS

Weld Symbol definitions per AWS A2.4:2007



BACKING
BAR



WELD ALL
AROUND



BEVEL WELD, ARROW
SIDE with BEVEL
ANGLE